

## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: DR. FENSTERMACHER Examiner #: 72421 Date: 3/29/02  
Art Unit: 3602 Phone Number 305-7438 Serial Number: 09/05/248  
Mail Box and Bldg/Room Location: \_\_\_\_\_ Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include: the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

5996431

15m

\$22.38

## STAFF USE ONLY

	Type of Search	Vendors and cost where applicable
Searcher: <u>[Signature]</u>	NA Sequence (#) _____	STN <u>✓</u>
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) _____	Questel/Orbit <u>✓</u>
Date Searcher Picked Up: _____	Bibliographic <u>✓</u>	Dr. Link _____
Date Completed: _____	Litigation _____	Lexis/Nexis <u>✓</u>
Searcher Prep & Review Time: _____	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: <u>15m</u>	Other _____	Other (specify) _____

Source: [All Sources](#) > [Area of Law - By Topic](#) > [Patent Law](#) > [Patents](#) > [U.S. Patents](#) > [Utility, Design and Plant Patents](#)

Terms: **patno=5996431** ([Edit Search](#))

*Pat. No. 5996431, \**

**5,996,431**

◆ GET 1st DRAWING SHEET OF 4

Dec. 7, 1999

Twist action friction drive

**INVENTOR:** Pierse, Michael George, Bedford, United Kingdom

**ASSIGNEE-AT-ISSUE:** Unova U.K. Limited, Avlesbury, United Kingdom (03)

**APPL-NO:** 51,248

**FILED:** Apr. 2, 1998

**PCT-FILED:** Apr. 30, 1997

**PCT-NO:** PCT/GB97/01174

**PCT-PUB-NO:** WO98/10206

**PCT-PUB-DATE:** May 12, 1998

**INT-CL:** [6] F16H 21#16

**US-CL:** 74#25; 74#89

**PRIM-EXMR:** Graysay, Tamara L.

**ASST-EXMR:** Fenstermacher, David

**CORE TERMS:** roller, drive, driven, tube, friction drive, oil, skewed, hydrostatic, axial, forward...

Source: [All Sources](#) > [Area of Law - By Topic](#) > [Patent Law](#) > [Patents](#) > [U.S. Patents](#) > [Utility, Design and Plant Patents](#) **i**

Terms: **patno=5996431** ([Edit Search](#))

View: **Custom** - [Modify](#)

Segments: After-issue, Appl-no, Assign-action, Assign-contact, Assign-date, Assign-frame, Assign-reel, Assignee, Assignor-info, Asst-exmr, At-issue, Certcorr, Date, Disclaimer, Exmr, Expiration-date, Filed, Govt-int, Int-cl, Inventor, Lit-reex, Patno, Pct-filed, Pct-no, Pct-pub-date, Pct-pub-no, Prim-exmr, Reex-cert, Reissue, Rel-us-data, Title, Us-cl

Date/Time: Friday, March 29, 2002 - 11:45 AM EST

---

[About LexisNexis](#) | [Terms and Conditions](#)

---

Copyright © 2002 LexisNexis, a division of Reed Elsevier Inc. All rights reserved.

**No Documents Found**

No documents were found for your search (5996431 or 5,996431). Please edit your search and try again. You may want to try one or more of the following:

- Check for spelling errors.
- Remove some search terms.
- Use more common search terms.
- If applicable, look for all dates.

[Edit Search](#)

---

[About LexisNexis](#) | [Terms and Conditions](#)

---

Copyright © 2002 LexisNexis, a division of Reed Elsevier Inc. All rights reserved.

*Patent Cases from  
Federal Courts &  
Admin. Material*

**No Documents Found**

No documents were found for your search (5996431 or 5,996,431).  
Please edit your search and try again. You may want to try one or more of the following:

- Check for spelling errors.
- Remove some search terms.
- Use more common search terms.
- If applicable, look for all dates.

[Edit Search](#)

---

[About LexisNexis](#) | [Terms and Conditions](#)

---

Copyright © 2002 LexisNexis, a division of Reed Elsevier Inc. All rights reserved.

*Patent, Trademarks  
Copyright, Biotechnology  
Combined*

?us5996431/pn

\*\* SS 1: Results 1

Search statement 2

?prt full nonstop legal1

ER 6

LEGALL

You have typed an incorrect word : please check your input

Search statement 2

?prt full nonstop legal11

1/1 PLUSPAT - (C) QUESTEL-ORBIT

PN - US5996431 A 19991207 [US5996431]

TI - (A) Twist action friction drive

PA - (A) UNOVA UK LTD (GB)

IN - (A) PIERSE MICHAEL GEORGE (GB)

AP - US5124898 19980402 [1998US-0051248]

PR - GB9618642 19960906 [1996GB-0018642]

- WOGB9701174 19970430 [1997WO-GB01174]

IC - (A) F16H-021/16

EC - F16H-019/02B

PCL - ORIGINAL (O) : 074025000; CROSS-REFERENCE (X) : 074089000

DT - Corresponding document

CT - US4203328; US4760864; US4921207; US5363711; DE3005147; JP61038256

- Marks' Standard Handbook For Mechanical Engineers, 10th Ed, pp. 8-130 to 8-131.

STG - (A) United States patent

AB - PCT No. PCT/GB97/01174 Sec. 371 Date Apr. 2, 1998 Sec. 102(e) Date Apr. 2, 1998 PCT Filed Apr. 30, 1997 PCT Pub. No. WO98/10206 PCT Pub. Date May 12, 1998A twist action roller friction drive comprises a rotating drive bar which drives in rotation a roller the axis of rotation of which is inclined relative to the axis of a rotationally fixed driven member with which the roller engages. The inclined roller comprises a single annular roller urged from the inside into driving contact with the driven member by one or more hydrostatic pads. The driven member is a tube and the skewed annular roller is in frictional engagement with the bore of the tube. In a typical use, the tube is fixed to the carriage of a machine tool and is aligned with the machine axis. Oil for the hydrostatic pad(s) acting on the roller is supplied through the drive bar along the axis thereof At its trailing end, the drive bar rotationally drives a skewed roller assembly in which the annular roller is incorporated, the remote forward end of the drive bar being driven in rotation, as by an electric motor Axial movement of the driven member is principally determined by the angle of skew of the roller so that if this angle is made very small, similarly small precise axial movements of the driven member of as little as 1 nm (nanometre) or less can be readily achieved, per revolution of the drive bar. This permits a high speed drive motor and in turn velocity feed back control.

etelka griffin

1/1 LGST - (C) LEGSTAT  
PN - US 5996431 [US5996431]  
AP - US 51248/98 19980402 [1998US-0051248]  
DT - US-P  
ACT - 19980402 US/AE-A  
APPLICATION DATA (PATENT)  
{US 51248/98 19980402 [1998US-0051248]}  
- 19991207 US/A  
PATENT  
UP - 2000-04

Search statement 2

?file inpadoc

Search statement 2

?famstate nonstop

1/7 INPADOC - (C) INPADOC

PN - EP 925460 A1 19990630 [EP-925460]  
TI - TWIST ACTION FRICTION DRIVE  
LA - ENG  
IN - PIERSE MICHAEL GEORGE [GB]  
PA - UNOVA UK LTD [GB]  
AP - EP 97918265/97-A 19970430 [1997EP-0918265]  
PR - WO 9701174/97 (GB) -W 19970430 [1997WO-GB01174]  
- GB 9618642/96-A 19960906 [1996GB-0018642]  
IC - F16H-019/02  
DS - DE\* ES\* FR\* IT\*

1/1 LEGALI - (C) LEGSTAT

PN - EP 925460 [EP-925460]  
AP - EP 97918265/97 19970430 [1997EP-0918265]  
DT - EP-P  
ACTE- 19970430 EP/AE-A  
EP-APPLICATION  
{EP 97918265/97 19970430 [1997EP-0918265]}  
- 19990630 EP/AK-A1 [+]  
DESIGNATED CONTRACTING STATES IN AN APPLICATION WITH SEARCH REPORT:  
DE ES FR IT  
- 19990630 EP/A1 [+]  
PUBLICATION OF APPLICATION WITH SEARCH REPORT  
- 19990630 EP/17P [+]  
REQUEST FOR EXAMINATION FILED  
19980219  
- 20010328 EP/17Q [+]  
FIRST EXAMINATION REPORT  
20010207  
UP - 2001-13

2/7 INPADOC - (C) INPADOC

PN - GB 2316993 B2 20000726 [GB2316993]  
TI - TWIST ACTION FRICTION DRIVE  
IN - PIERSE MICHAEL GEORGE [GB]  
PA - WESTERN ATLAS UK LTD [GB]; UNOVA UK LTD [GB]  
AP - GB 9618642/96-A 19960906 [1996GB-0018642]  
PR - GB 9618642/96-A 19960906 [1996GB-0018642]  
IC - F16H-019/02

1/1 LEGALI - (C) LEGSTAT

PN - GB 2316993 [GB2316993]  
AP - GB 9618642/96 19960906 [1996GB-0018642]  
DT - GB-P  
ACTE- 19960906 GB/AE-A  
APPLICATION DATA  
{GB 9618642/96 19960906 [1996GB-0018642]}  
- 19980311 GB/A1  
APPLICATION PUBLISHED  
- 20000726 GB/B2 [+]  
PATENT GRANTED

etelka griffin

UP - 2000-30

3/7 INPADOC - (C) INPADOC  
PN - GB 9618642 A0 19961016 [GB9618642]  
TI - TWIST ACTION FRICTION DRIVE  
PA - WESTERN ATLAS UK LTD  
AP - GB 9618642/96-A 19960906 [1996GB-0018642]  
PR - GB 9618642/96-A 19960906 [1996GB-0018642]

4/7 INPADOC - (C) INPADOC  
PN - GB 2316993 A1 19980311 [GB2316993]  
TI - TWIST ACTION FRICTION DRIVE FOR CONVERTING ROTARY TO LINEAR MOTION  
IN - PIERSE MICHAEL GEORGE  
PA - WESTERN ATLAS UK LTD [GB]; UNOVA UK LTD [GB]  
AP - GB 9618642/96-A 19960906 [1996GB-0018642]  
PR - GB 9618642/96-A 19960906 [1996GB-0018642]  
IC - F16H-019/02

1/1 LEGALI - (C) LEGSTAT  
PN - GB 2316993 [GB2316993]  
AP - GB 9618642/96 19960906 [1996GB-0018642]  
DT - GB-P  
ACTE- 19960906 GB/AE-A  
APPLICATION DATA  
{GB 9618642/96 19960906 [1996GB-0018642]}  
- 19980311 GB/A1  
APPLICATION PUBLISHED  
- 20000726 GB/B2 [+]  
PATENT GRANTED  
UP - 2000-30

5/7 INPADOC - (C) INPADOC  
PN - JP 11502293 T2 19990223 [JP11502293]  
AP - JP 509463/98-A 19970430 [1998JP-0509463]  
PR - WO 9701174/97 (GB)-W 19970430 [1997WO-GB01174]  
- GB 9618642/96-A 19960906 [1996GB-0018642]  
IC - F16H-019/02

6/7 INPADOC - (C) INPADOC  
PN - US 5996431 A 19991207 [US5996431]  
TI - TWIST ACTION FRICTION DRIVE  
IN - PIERSE MICHAEL GEORGE [GB]  
PA - UNOVA UK LTD [GB]  
AP - US 51248/98-A 19980402 [1998US-0051248]  
PR - GB 9618642/96-A 19960906 [1996GB-0018642]  
- WO 9701174/97 (GB)-W 19970430 [1997WO-GB01174]  
IC - F16H-021/16

1/1 LEGALI - (C) LEGSTAT  
PN - US 5996431 [US5996431]  
AP - US 51248/98 19980402 [1998US-0051248]  
DT - US-P  
ACTE- 19980402 US/AE-A  
APPLICATION DATA (PATENT)  
{US 51248/98 19980402 [1998US-0051248]}

etelka griffin



- 19991207 US/A  
PATENT  
UP - 2000-04

7/7 INPADOC - (C) INPADOC  
PN - WO 9810206 A1 19980312 [WO9810206]  
TI - TWIST ACTION FRICTION DRIVE  
LA - ENG  
IN - PIERSE MICHAEL GEORGE [GB]  
PA - UNOVA UK LTD [GB]; PIERSE MICHAEL GEORGE [GB]  
AP - WO GB 9701174/97(GB)-A 19970430 [1997WO-GB01174]  
PR - GB 9618642/96-A 19960906 [1996GB-0018642]  
IC - F16H-019/02  
DS - JP\* KR\* SG\* US\* AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE

1/3 LEGALI - (C) LEGSTAT  
PN - JP 509463/98  
AP - JP 509463/98 - [1998JP-0509463]  
DT - JP-A  
ACTE- 19980227 JP/REFW-P  
CORRESPONDS TO PCT APPLICATION  
<WO 9810206> [WO9810206]  
UP - 1998-51

2/3 LEGALI - (C) LEGSTAT  
PN - US 51248/98  
AP - US 51248/98 - [1998US-0051248]  
DT - US-A  
ACTE- 19980402 US/REFW-P  
CORRESPONDS TO PCT APPLICATION  
<WO 9810206> [WO9810206]  
UP - 1998-44

3/3 LEGALI - (C) LEGSTAT  
PN - WO 9810206 [WO9810206]  
AP - WO 9701174/97(GB) 19970430 [1997WO-GB01174]  
DT - WO-P  
ACTE- 19970430 WO/AE-A  
APPLICATION DATA  
{WO 9701174/97(GB) 19970430 [1997WO-GB01174]}  
- 19980227 WO/ENP-A  
ENTRY INTO THE NATIONAL PHASE IN:  
<JP 98509463>  
- 19980312 WO/AK-A1 [+]  
DESIGNATED STATES CITED IN A PUBLISHED APPLICATION WITH SEARCH REPORT  
JP KR SG US  
- 19980312 WO/AL-A1 [+]  
DESIGNATED COUNTRIES FOR REGIONAL PATENTS CITED IN A PUBLISHED  
APPLICATION WITH SEARCH REPORT  
AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE  
- 19980312 WO/A1 [+]  
PUBLICATION OF THE INTERNATIONAL APPLICATION WITH THE INTERNATIONAL  
SEARCH REPORT  
- 19980402 WO/ENP-A  
ENTRY INTO THE NATIONAL PHASE IN:  
<US 9851248 19980402>  
- 19980708 WO/121  
EP: PCT APP. ART. 158 (1)  
UP - 1998-51